

**Policy: W-04-05**  
**Policy Title: Disinfection of Tanks – New and Existing**  
**Policy Purpose: Water Quality**  
**Implementation Date: 10/20/2004**  
**Revision Date: N/A**

**TOWN OF WESTFIELD**  
**PUBLIC WORKS DEPARTMENT**  
**DISINFECTION OF TANKS – NEW AND EXISTING**

Whenever a storage vessel containing finished water is removed from service for inspection and maintenance, or if a new storage vessel is constructed, the Westfield Public Works Department will disinfect it before placing it in service.

Three methods of chlorination as specified in AWWA C652-86 are: 1) chlorination of the full storage facility such that at the end of the appropriate retention period the water will have a free chlorine residual of not less than 10 mg/L; 2) spraying or painting of all storage facility water contact surfaces with a solution of 200 mg/L available chlorine, and ; 3) chlorination of full storage facility with water having a free chlorine residual of not less than 2 mg/L after 24 hours. Typically, only one method will be used for a given storage facility disinfection, but combinations of the methods may be used. Where state or local regulations require more stringent procedures, then those regulations will govern.

**A. Chlorination Method I**

The water storage facility will be filled to the overflow level with potable water to which enough chlorine is added to provide a free chlorine residual in the full facility of not less than 10 mg/L at the end of the appropriate period of 6 hours or 24 hours. The chlorine, either as calcium hypochlorite, sodium hypochlorite or liquid chlorine, will be introduced into the water as described hereafter. Appendix A and Appendix B are attached for reference.

Liquid chlorine use. Liquid chlorine will be introduced into the water filling the storage facility to give a uniform chlorine concentration during the entire filling operation. Portable chlorination equipment will be carefully operated and will include a liquid chlorine cylinder, gas-flow chlorinator, chlorine ejector, safety equipment, and an appropriate solution tube to inject the high concentration chlorine solution in the filling water. The solution tube will be inserted through an appropriate valve located on the inlet pipe near the storage facility such that the chlorine solution will mix readily with the inflowing water.

Sodium hyochlorite use. Sodium hypochlorite will be applied to the water entering the storage facility by means of a chemical feed pump, or will be applied

by handpouring into the storage facility and allowing the inflowing water to provide the desired mixing.

When a chemical feed pump is used, the concentrated chlorine solution will be pumped through an appropriate solution tube to inject the high concentration chlorine solution at a rate which will give a uniform chlorine concentration in the filling water. The solution tube will be inserted through an appropriate valve located on the inlet pipe near the storage facility such that the chlorine solution will mix readily with the filling water.

When the sodium hypochlorite is poured into the storage facility, the filling of the storage facility will begin immediately thereafter or as soon as any manhole covers can be closed. The sodium hypochlorite may be poured through the cleanout or inspection manhole in the lower course or level of the storage facility, or in the riser pipe of an elevated tank, or through the roof manhole. The sodium hypochlorite will be poured into the water in the facility when such water is not more than 3 feet in depth, nor less than 1 foot in depth or as close thereto as manhole locations permit.

Calcium hypochlorite use. Calcium hypochlorite granules or tablets broken or crushed to sizes not larger than ¼ inch maximum dimension, may be poured or carried into the storage facility through the cleanout or inspection manhole in the lower course or level of the storage facility, or into the riser pipe of an elevated tank, or through the roof manhole. The granules or tablet particles will be placed in the storage facility prior to flowing water into it, and will be so located that the inflowing water will assure a current of water circulating through the calcium hypochlorite and dissolving it during the filling operation. The calcium hypochlorite will be placed only on dry surfaces unless adequate precautions are taken to provide ventilation or protective breathing equipment.

Retention period. After the storage facility has been filled with the disinfecting water, it will stand full as follows: 1) for a period of not less than 6 hours when the water entering the storage facility has been chlorinated uniformly by gas-feed equipment or chemical pump, 2) for a period of not less than 24 hours when the storage facility has been filled with water which has mixed with sodium hypochlorite or calcium hypochlorite within the storage facility.

## B. Chlorination Method II

A solution of 200 mg/L available chlorine will be applied directly to the surfaces of all parts of the storage facility which would be in contact with water when the storage facility is full to the overflow elevation.

Method of Application. The chlorine solution may be applied with suitable brushes or spray equipment. The solution will thoroughly coat all surfaces to be treated, including the inlet and outlet piping, and will be applied to any separate

drain piping such that it will have available chlorine of not less than 10 mg/L when filled with water. Overflow piping need not be disinfected.

Retention. The surfaces disinfected will remain in contact with the strong chlorine solution for at least 30 minutes, after which potable water will be admitted, the drain piping will be purged of the 10mg/L chlorinated water, and the storage facility will then be filled to its overflow level. Then, subject to satisfactory bacteriological testing and acceptable aesthetic quality, such water may be served to the distribution system.

### C. Chlorination Method III

Water and chlorine will be added to the storage facility in amounts such that initially the solution will contain 50 mg/L available chlorine and will fill approximately 5% of the total storage volume, and this solution will be held in the storage facility for a period of not less than 6 hours. The storage facility will then be filled to the overflow level by flowing potable water into the highly chlorinated water, and will be held full for a period of not less than 24 hours. All highly chlorinated water will then be purged from the drain piping. Then, subject to satisfactory bacteriological testing and acceptable aesthetic quality, the remaining water may be delivered to the distribution system.

Adding Chlorine. The actual volume of the 50 mg/L chlorine solution will be such that after the solution is mixed with filling water and the storage facility is held full for 24 hours there will be free chlorine residual of not less than 2 mg/L.

## HANDLING OF DISINFECTION WATER

After the retention period the free chlorine residual in the storage facility will be reduced to a concentration prior to distribution (not more than 2 mg/L) by completely draining the storage facility and refilling with potable water, or by combination of additional holding time and blending with potable water having a low chlorine concentration. Then, subject to satisfactory bacteriological testing and acceptable aesthetic quality, such water may be served to the distribution system.

The environment to which the chlorinated water is to be discharged will be inspected, and if there is any question that the chlorinated discharge will cause damage to the environment, then a reducing agent will be applied to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water. Federal, state or local environmental regulations may require special provisions or permits prior to disposal of highly chlorinated water. Proper authorities will be contacted prior to disposal of highly chlorinated water.

## TESTING

No water in the tank will be allowed to enter into the distribution system until it is tested. Tests for coliform bacteria and odor will be made by the department, and the storage vessels will not be placed into service until the results of the tests are acceptable. No coliform bacteria and odor will be permitted.

Should the initial treatment prove to be ineffective for bacteria, the chlorination procedure will be repeated until satisfactory results are obtained. Any odors of paint solvents will result in draining the tank, allowing further air curing, then refilling.

Bruce A. Hauk, Director  
Westfield Public Works